



# **Strategic Transport Planning and Evaluation**

## **The Scandinavian Experience**

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The Scandinavian Experience

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**Summary:**

The report presents national strategic transport planning and the evaluation methodology applied for this purpose in Denmark, Norway and Sweden. It is based on a paper prepared for the TRANS-TALK Thematic Network "Policy and Project Evaluation Methodologies" under the EU Competitive and Sustainable Growth Programme. The review shows that the strategic planning concept as applied in Scandinavia is fairly advanced and well designed. Current comprehensive and cross-sectoral transport planning has its conceptual roots in the national long term planning of transport infrastructure projects, which started in the 1960's. The concept has changed dramatically over the last three decades "from project focus to strategies". The report discusses whether current methods address strategic planning needs and the need for further development.

**Sammendrag:**

Notatet gir en oversikt over den nasjonale strategiske transportplanleggingen og de planleggingsmetoder som anvendes i Danmark, Norge og Sverige. Det bygger på et paper utarbeidet for TRANS-TALK Thematic Network "Policy and Project Evaluation Methodologies" under EU's Competitive and Sustainable Growth Programme. Gjennomgangen viser at det planleggingskonseptet som anvendes i Skandinavia i dag er forholdsvis avansert og gjennomarbeidet. Det helhetlige og tverrsektorielle konseptet som brukes har sitt utgangspunkt i de systemer for langtidsplanlegging av transportinfrastruktur som ble utviklet på 1960-tallet. Konseptet har imidlertid endret seg vesentlig underveis fra å fokusere på prosjekter til å dreie seg om valg av strategi. Notatet diskuterer om dagen metoder tilfredsstiller kravene til strategisk planlegging og hvordan de kan utvikles videre.

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# Preface

This report is based on a paper presented to the workshop on Projects, Programmes and Policies: Evaluation Needs and Capabilities held 6-8 November 2000 in Brussels. The workshop was convened by the TRANS-TALK Thematic Network "Policy and Project Evaluation Methodologies" under the Competitive and Sustainable Growth Programme of the European Commission's Fifth Framework Programme.

The text of the report presents an overview of national strategic transport planning and the evaluation methodology applied for this purpose in Scandinavia, that is Denmark, Norway and Sweden. It is based on a review of available literature about such planning in the three countries and, in particular, a range of ex post evaluation studies carried out in Norway and Sweden the last few years.

The text has been written by Mr. Henning Lauridsen. Mrs. Bjørg Mannsverk has taken care of the final editing of the report.

Comments on the draft paper have been received from various sources. All comments received have been considered and wherever possible taken into account during the preparation of the final version as presented in the report. We want in particular to thank the TRANS-TALK Steering Committee, the Danish Transport Council and the Swedish Institute for Transport and Communications Analysis for their constructive and helpful comments.

Oslo, December 2000  
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**Summary:**

# **Strategic Transport Planning and Evaluation: The Scandinavian Experience**

This report is based on a paper presented to the Second Workshop of the TRANS-TALK Thematic Network "Policy and Project Evaluation Methodologies" under the Competitive and Sustainable Growth Programme of the European Commission's Fifth RTD Framework Programme. The workshop, which was held 6-8 November 2000 in Brussels, was about Projects, Programmes and Policies: Evaluation Needs and Capabilities.

## **Current Planning Approach and Evaluation Methodology**

The report presents an overview of strategic transport planning and the evaluation methodology applied for this purpose in Scandinavia, that is Denmark, Norway and Sweden. There are similarities between the planning concepts applied in the three countries and two of them, Norway and Sweden, have developed their national transport planning systems along the same lines. The planning systems are at this stage more developed in Norway and Sweden than in Denmark and the ex post evaluation studies presented all relate to the former two countries. The report, consequently, has a stronger focus on Norway and Sweden than on Denmark, but there are indications that the planning system in Denmark may move in the same direction as in the other two countries. It also appears, that the professional communities in all three countries now subscribe to the same conceptual framework for strategic planning and evaluation.

The report makes an attempt of defining the terminology applied in respect of planning and the corresponding ex ante evaluation. Three levels are identified, namely:

1. The conceptual level, that is the basic principles and planning concept that provide the overall framework for the planning system
2. The approach level, that is the planning and evaluation approach or the overall methodological approach that applies for the actual planning situation and that is reflected directly in the planning process
3. The planning tools or evaluation methods level, that is the specific evaluation methods that are used in the various phases of the planning process

The review of the Scandinavian experience of national strategic transport planning shows that the planning concept in many respects is fairly advanced and well designed. Current comprehensive and cross-sectoral strategic transport planning has its conceptual roots in the national long term planning of transport infrastructure projects, which started in the 1960's. The planning concept has changed dramatically over the last three decades and the report presents this change under the headings of three generations of national transport planning systems. A short version of the changes would be "from project focus to strategies".

The main features of the planning system currently applied in Scandinavia are inclusion of all transport modes in the planning process, prioritisation of measures across sectors and use of alternative strategies to demonstrate the latitude for decision-making. Ideally the measures considered should include not only investment projects but also others found relevant, such as pricing and regulatory measures. The planning concept is based on that politicians are responsible for defining objectives and at the end of the process decide on a strategy. It implies that the planners, which include the national transport agencies for air, railway, road and sea transport, develop alternative strategies based on a combination of measures from all sectors and assess the impacts of each alternative in respect of the various objectives defined. This provides the input for the politicians' decision on strategy. When the strategy is defined, the national transport agencies start their planning of implementation, usually through ten years action plans where implementation of the individual measures is prioritised in time and where the programmes for the first four years usually are more detailed.

The table below summarises the description of the planning concepts and the different types of methodology currently applied in the Denmark, Norway and Sweden for national strategic transport planning.

*Table 1 Overview of Planning Concept Features, Evaluation Approaches and Methods for National Strategic Transport Planning in Scandinavia*

Level	Item	Denmark	Norway	Sweden
1) Planning concept	Objective-oriented	x	x	x
	Strategy-oriented		x	x
	Project-oriented	x		
	Cross-sectoral		x	x
2) Approach	Process-oriented	(x)	x	x
	System analysis		x	x
3) Methods & supporting tools	Cost-benefit analysis	x	x	x
	Multi-criteria analysis	(x)	x	(x)
	Impact analysis	x	x	x
	National transport demand models		x	x
	Regional transport demand models			x
	Other demand models	x		



The table shows the similarities between the planning and evaluation systems in Norway and Sweden and the somewhat different situation in Denmark. If we had included ex post evaluation, the differences would have become even stronger.

Ex post evaluation studies are currently applied systematically for learning by experience in Norway and Sweden but not in Denmark. The results of the studies contribute to more systematic improvements of the planning system and the evaluation methodologies. There are two main types, the one evaluating the planning process and the other investigating the various evaluation methods and their use. Due to these studies, Scandinavian experience also contributes to the picture of how planning processes and planning tools perform in the real world.

### **Do Current Methods address Strategic Planning Needs?**

#### *The Political Process*

It is difficult at this stage to assess the relevance of the current strategic planning process in respect of the subsequent political decision-making process in Parliament. It is, however, only when the technical planning process can be seen in the light of the political process, that we get full feedback about the appropriateness of the technical process.

A study about Parliament's discussion of the Norwegian Road- and Road Traffic Plan for the previous planning period casts some light on the matter. The study concluded that very few politicians did seriously consider and use the information on alternative strategies. It is, therefore, at this point in time not clear whether the strategic transport planning processes currently applied really provide the most relevant decision information for the politicians. An ongoing study about the political process concerning the National Transport Plan in Norway is, however, looking further into the matter.

#### *The Planning and Methodological Approach*

Generally the current approach is well in line with the requirements of the conceptual framework. There are, however, some matters of concern.

One concern is the objectives that guide the planning process. There are cases where there are discrepancies between the objectives and the measures available to the planning agencies. A key conclusion is that policy objectives should be realistic and achievable within a reasonable time perspective compared to the range of measures available to the strategic transport planners. If the objectives are more ambitious and broadly defined, planners should also be allowed to use a wider set of measures, but that may shift focus away from the measures controlled by themselves.

Another concern is the strategy concept applied in Norway and Sweden. The planning agencies are requested to develop alternative strategies that include different combinations of actions and measures. The basic idea behind the strategy concept is that politicians shall discuss strategies rather than projects and, finally, select a strategy, which then will provide the framework for the more detailed planning and implementation. Experience from ex post evaluation shows that

there are good reasons to discuss whether the above approach to strategy-orientation is the best. It appears that the strategies developed by the planning agencies not necessarily are significantly different in respect of projects and measures included. Further, the little we know at this stage about the political process does not indicate that politicians find the strategies particularly useful in their decision-making process. The strategies may, however, be useful for others such as the Ministry of Transport.

The evaluation studies revealed serious problems, in respect of cross-sectoral prioritisation in both Norway and Sweden. It is, therefore, an open question to which extent these problems were due to insufficient knowledge or to lack of tools, which normally would be the conclusion of planners, or to which extent the professional level of ambition for such planning is realistic? It seems, however that the planning approach and the ambitious processes were more to blame than the various evaluation methods and planning tools applied.

It appears that the planning approach can be improved by re-organising the process. A division into a first a phase of clarification of general policy principles through a set of analyses of strategic issues and a second phase of developing alternative strategies may be a better approach. Further, there are reasons to believe that the regional level should play a bigger role in the national planning process. A two phased approach would facilitate involvement from the regional level at an appropriate time in the first phase of the process.

Experience from Norway and Sweden shows that the inherent institutional characteristics of the planning agencies are key factors in the process. The road agencies and the rail agencies played the most important roles, whereas the civil aviation agencies, which are financed through user charges, kept a low profile. It may, therefore, be worthwhile to consider if the process can be organised differently with a clearer distinction between efforts that must be carried out jointly and matters that do not necessarily involve all agencies.

### **The Need for further Development of Evaluation Methods**

Ex post evaluations of planning methods in Sweden addressed the methods for cost-benefit analysis. The general conclusion was that the methods as such appear to be sound and sufficient for the purpose. Questions raised concerned primarily current practises. A more serious question, however, concerned the quality of input data, in particular traffic data. It may, therefore, at this stage be more important to improve traffic data and to introduce a reliable system for documentation of such data, than to improve the methods for cost-benefit analysis. A previous evaluation study raised some doubt about application of the methods and asked if they had been adapted to the results wanted.

The evaluation of the Norwegian strategic planning process showed that the agencies were not able to evaluate impacts across sectors in a comparable way. The coastal agency and the civil aviation agency were hardly able to assess the impact of their own measures at all. In addition, the agencies faced problems in handling intermodal transport in a satisfactory way. There is consequently a need for developing compatible methods for all sectors.

There were shortcomings in respect of better methods for analyses of the specific strategic areas, which formed a new and important element of the Swedish strategic analysis. This applied not least to the analysis of maintenance needs. It is therefore important to improve methods for analysis of strategic issues.

There is obviously a need for further development of the evaluation methods and in particular some of the supporting tools such as the national and regional transport demand models. Current practises may to some extent be a bigger problem than the methods per se and it appears that it is highly important to ensure that input data are of sufficient quality and documented properly. Development of the specific evaluation methods must be done in such way that they fit into the overall evaluation approach.



# 1 Introduction

This report presents an overview of strategic transport planning and the evaluation methodology applied for this purpose in Scandinavia, that is Denmark, Norway and Sweden. There are similarities between the planning concepts applied in the three countries and two of them, Norway and Sweden, have developed their national transport planning systems along the same lines.

A variety of evaluation methodologies are applied in Scandinavia. In addition to ex ante evaluation methods applied as planning tools during the planning process, a considerable number of ex post evaluation studies have been carried out in Norway and Sweden. Due to these studies, Scandinavian experience also contributes to the picture of how planning processes and planning tools perform in the real world. This is highly important, as it is only when we know the end results of the planning process that we can make conclusions in respect of the quality of the process, the approach for evaluation and the various evaluation methods applied underway. It appears that the emphasis on ex post evaluation is a particularly strong feature in Scandinavia and more so than in most other countries. The paper, therefore, has a strong focus on ex post evaluations of strategic transport planning and the lessons learned from them. The concluding discussion of key issues concerning strategic transport planning and evaluation in Section 7 is to a high extent based on experience gained through ex post evaluation studies.

The report describes the national strategic planning systems, which at this stage are more developed in Norway and Sweden than in Denmark. The ex post evaluation studies presented all relate to the former two countries. The report, consequently, has a stronger focus on Norway and Sweden than on Denmark, but there are indications that the planning system in Denmark may move in the same direction as in the other two countries. It also appears, that the professional communities in all three countries now subscribe to the same conceptual framework for strategic planning and evaluation. The three countries may, therefore, have more in common in respect of strategic transport planning than what the current planning systems indicate and the conclusions drawn in the paper may be of relevance for all three countries.

The report makes an attempt of defining the terminology applied in respect of planning and the corresponding ex ante evaluation. Three levels are identified, namely:

1. The conceptual level, that is the basic principles and planning concept that provide the overall framework for the planning system
2. The approach level, that is the planning and evaluation approach or the overall methodological approach that applies for the actual planning situation and that is reflected directly in the planning process

3. The planning tools or evaluation methods level, that is the specific evaluation methods that are used in the various phases of the planning process

A more detailed discussion of the contents of above three levels appears in Sub-section 3.1 below.

Subsequent to this introduction, Section 2 describes the changing strategic transport planning concepts applied in Scandinavia. Section 3 presents and defines the planning and evaluation typologi used and gives an overview of application in the three Scandinavian countries. Section 4 and Section 5 present the most important ex post evaluations of the national transport planning processes in Norway and Sweden. Section 6 gives an overview of ex post evaluations related to the various methods or tools applied in the strategic transport planning process in Sweden. Section 7 comprises a discussion of whether the current planning methods address the strategic planning needs and focuses on a number of conceptual questions. Finally, the main conclusions of the paper appear as Section 8. References, which appear in brackets in the text, follow as Section 9.

## **2 The Changing Planning Concept**

The current comprehensive and cross-sectoral strategic transport planning in Scandinavia has its conceptual roots in the national long term planning of transport infrastructure projects, which started in the 1960's. The planning concept has changed dramatically over the last three decades and the report presents this change under the headings of three generations of national transport planning systems. A short version of the changes could be "from project focus to strategies", but several other dimensions also change.

### **2.1 First Generation National Planning Systems**

The Scandinavian planning focus in the 1960's was clearly on road infrastructure, for which there was an enormous demand due to the rapid increase in car ownership. The development of cost benefit analysis (CBA) at the same time provided the planners with a new planning tool that fitted very well into the predominant concept of national planning for economic development. CBA was also very well adapted to address what became the main and almost only question in road planning at that time, namely to identify those projects that should be implemented first.

The traditional CBA method became the methodological basis for the first generation of national transport planning systems in Scandinavia. Government considered economic long-term planning highly important, and the transport agencies rapidly adapted the concept to their sector with the road agency as the leader. Long-term plans were very useful for the agencies as they provided a more stable framework for investments than the annual budget. The plans provided the basis for white papers that were presented to and approved by Parliament, which gave political legitimacy to the investment programmes. This national planning system worked extremely well for the road sector and its main features did survive until the mid-1990's in Norway and Sweden, which both had extensive national road systems. In some respects, the system may still apply for the much more limited national road system in Denmark where CBA methods still appear to be important planning tool for the road agency. All three countries developed handbooks for cost-benefit analysis of road projects at an early stage and have continuously improved and updated these handbooks.

The First Norwegian Road Plan represents a typical first generation national planning system. It was based on the work of a Government appointed committee in the late 1960's. The committee developed planning methods, among them the first Norwegian computer based method for cost benefit analysis, and identified

and investigated a large number of investment projects on the national road network. Cost and benefits were calculated for each project. Finally, the committee recommended a long-term development programme within an overall financial framework for investments in national roads for the period. The programme included those projects that had the highest ranking according to the CBA calculations. Based on the recommendations of the planning committee, the Ministry presented the plan to Parliament. The politicians adopted the main features of the plan, but had clear and to a high extent different views on the priorities of projects within the programme. More importantly, however, the planning system was accepted as a rolling system with four years intervals, and it remained in many respects the basis for long-term road planning in Norway until the late 1990's. The political process, however, had clearly revealed that prioritising based on the CBA method as applied then, was not the final answer to the planning problem. Against this background, a search was started for better methods for prioritising projects.

## **2.2 Second Generation National Planning Systems**

Second generation national planning systems for the transport sector were still characterised by a mode by mode approach and the road sector was clearly the leader. The planning concept, however, gradually became more complex than the socio-economic efficiency concept of the first generation systems.

Transport planning in the early 1970's had to adapt to a more complicated world with several other dimensions than socio-economic efficiency. Environmental concerns and road safety came at an early stage in as important dimensions, which not easily could be integrated into the CBA methods. Gradually also regional development became an issue for transport planners. Urban transport planning had at that stage become an issue in itself, and new complex planning methods were developed for this purpose, among them much more sophisticated demand models. The planning concept changed accordingly and became more problem- and objective-oriented. An early example was the Second Norwegian Road Plan, which focused much more on roads in urban areas. A new planning committee developed methods that could be applied also for urban roads, which could not be seen as isolated planning objects but had to be considered within a much wider context. The planning concept, consequently, focused much more on problem identification, definition of objectives aimed at solving the problems identified and alternative ways of solving them. The recommended planning approach therefore included four phases: Problem discussion and identification, definition of objectives, development of alternative sets of solutions for solving the problems identified and, finally, comparison of alternative solutions based on the objectives defined. The comparison provided a much better framework for the subsequent selection of the best solution by the decision-makers.

The above approach led to a clearer definition of the role of the planner in relation to the role of the decision-maker or politician. It further became a starting point for developing a range of impact assessment methods and multi-criteria analysis methods. These methods became important planning tools for the necessary



evaluation of impacts of alternative solutions and for prioritising or selection of the best solution in a planning situation where several objectives should be met in the best possible way. The planning concept developed for the Second Norwegian Road Plan in the 1970's was gradually improved through the 1980's. A first Norwegian handbook for impact assessment was published in 1988 and has since been updated and extended (Statens vegvesen). The latest version has also included the former very detailed cost-benefit analysis handbook as one of several planning tools for evaluation of road projects.

The division of labour between politicians and government ministries on one hand and the subordinated national agencies and enterprises on the other hand, gradually became an issue during the 1980's. Liberalisation, privatisation and institutional reform were parts of the rethinking of the principles for good governance in Scandinavia in the late 1980's and early 1990's. A Norwegian government appointed committee, which looked into the various aspects of good governance and organising of the central administration and the subordinate national agencies (Norges Offentlige Utredninger, 1988), presented recommendations on introduction of new objective-oriented management principles. The principles were in line with the business administration principle of management by objective. The new public sector management principles implied that politicians defined the objectives and made decisions on strategies, whereas the national agencies carried out their activities within the framework of the objectives set and the strategy defined. The principles were further developed and operationalised for the Norwegian Public Roads Administration by another committee (Norges Offentlige Utredninger, 1993). This committee adapted the principles to provide a framework also for strategic road planning thereby shifting the focus from a project-oriented approach to a strategy-oriented approach.

The strong focus on objective-oriented management and planning for the transport sector led to more emphasis on policy matters by developing goals, objectives and strategies for the sector. All Scandinavian countries embarked on this in the 1990's. A typical example is the Danish Transport 2005 exercise within the Ministry of Transport that resulted in discussion and identification of problems facing the sector, goals and overall sector strategies (Trafikministeriet 1993a) and formulation of a national transport policy (Trafikministeriet 1993b). The two final policy documents from the ministry were based on various studies of issues of strategic importance (Transportrådet, 1993).

The Danish transport policy introduced the principle of sustainable development as an overall goal for the transport sector. This principle is now generally accepted in Scandinavia as elsewhere in Europe. It therefore also became an important feature of the planning concept during the second generation planning systems. It may have contributed to the development towards third generation planning systems where all transport modes are seen together in the planning process. One mode may therefore be prioritised in relation to another because it better meets the objectives, of which some may derive from the goal of sustainable development.

The principle of sustainable development became important also for the development of the systems for environmental impact assessment (EIA) and strategic environmental assessment (SEA) in Scandinavia (Lerstang, T.). Methods

in this respect fall outside the scope of the paper. They are, however, quite important for transport planning.

The Swedish Strategic Road Plan 1994-2003 appears the ultimate version of the second generation national planning system. The plan introduced the concept of alternative strategies into Scandinavian transport planning (Lauridsen, H. et al.). Four main strategies were developed each emphasising different objectives. The road safety strategy, for instance, was developed with a particular view to reducing the number of killed and injured in road traffic. The national road agency developed the four alternative strategies by combining measures available to the agency, such as investment projects and maintenance activities. Subsequently, the agency assessed the impacts of each strategy in respect of the objectives defined. Based on the planning report, The Ministry of Transport prepared a white paper for Parliament. The politicians discussed the paper and decided on a strategy, which again provided the framework for the national road plan for the said period.

One of the main intentions with the above approach was that politicians should discuss and make decisions on strategies and not on individual projects, whereas the road agency should prioritise projects and other measures based on the selected strategy. This new planning concept paved the way for a more comprehensive approach that built on the same relationship between politicians and planners but included all transport modes in a cross-sectoral process.

## **2.3 Third Generation National Planning Systems**

The main features of the last generation national transport planning system as currently applied in Scandinavia are inclusion of all transport modes in the planning process, prioritisation of measures across sectors and use of alternative strategies to demonstrate the latitude for decision-making. Ideally such measures should include not only investment projects but also others found relevant, such as pricing and regulatory measures. The planning concept is based on the relation between decision-makers and planners as developed in the 1990's, i.e. that politicians are responsible for defining objectives and at the end of the process decide on a strategy. This implies that the planners, which include the national transport agencies for air, railway, road and sea transport, develop alternative strategies based on a combination of measures from all sectors and assess the impacts of each alternative in respect of the various objectives defined. This provides the input for the politicians' decision on strategy. When the strategy is defined, the national transport agencies start their planning of implementation, usually through ten years action plans where implementation of the individual measures is prioritised in time and where the programmes for the first four years usually are more detailed.

The above third generation national planning system is now applied in both Norway and Sweden. The planning concept is basically the same in the two countries but the planning approach and process varies somewhat among them. The planning concept as currently applied in Denmark is rather in line with the second generation systems as described above, as it has not integrated all transport modes into a joint process and is more project-oriented than strategy-oriented. The

current planning systems and methodologies in the three countries are described in more detail in Section 3 below.

## **3 The Current Evaluation Methodology**

A wide range of evaluation approaches and methods is currently applied in strategic transport planning in Scandinavia. In addition to ex ante evaluation methods, recent experience includes a number of ex post evaluation studies. This section presents a review of typology and an overview of the current planning methodology as applied in each country.

### **3.1 Typology and Main Features of the Planning and Evaluation System**

The paper deals with evaluation in two different situations. The first is a planning situation where the various evaluation methods are applied as planning tools within a certain planning concept and in relation to a specific planning approach. The second is an ex post evaluation situation where the quality of the planning process or the various methods applied is assessed. The main focus of the paper is, as stated in Section 1, the former situation, i.e. application of evaluation methodology in a planning situation, or more specifically for the purpose of strategic transport planning. There is, however, also a focus on ex post evaluation because a considerable range of ex post evaluations of strategic transport planning has been carried out in Scandinavia and because such evaluations are necessary if we want to gain knowledge about how evaluation methods perform in real life planning situations.

A planning system and the corresponding evaluation can be structured in a hierarchy of at least three different levels.

- The overall planning concept, i.e. the basic principles, which provide the conceptual framework for the planning system. The overall planning concept will usually be fixed in any given planning situation and therefore provide general guidelines for the approach level
- The planning and evaluation approach, i.e. the methodological approach that determines the use of the individual evaluation methods and that results in the design of a planning process which tallies with the conceptual framework
- The planning and evaluation tools, i.e. the individual methods or tools that are used in the various stages of the planning process

The new third generation concept that Scandinavia currently considers the most relevant for strategic transport planning is objective-oriented and cross-sectoral, see Section 2 above. This implies that planning is seen as a problem solving

process that shall respond to sets of goals, objectives and criteria, which to some extent may be contradictory, and aim at achieving them in the best possible way. The planning concept develops over time and can be considered a paradigm, which lasts for a certain period before it shifts. Changes, however, take time and the concept will therefore usually be fixed in any given planning situation and therefore provide the conceptual framework for the planning and evaluation approach.

Norway and Sweden have developed strategic transport planning systems that reflect the new concept, whereas the Danish planning system still partly reflects previous concepts. Due to this difference, the general methodological approach to strategic transport planning also varies considerably within Scandinavia. The approaches applied in Norway and Sweden appear to be more process-oriented and more based on system analysis than the approach used in Denmark. Elements of scenario techniques are also applied to a certain extent.

The differences among the three countries appear to be less in respect of the specific evaluation methods, which are applied as planning tools within the various stages that are defined by the planning process and the corresponding overall methodological approach. A considerable range of evaluation methods and supporting planning tools are applied in all or most countries, among them cost-benefit analysis and multi-criteria analysis. Increasingly evaluation tools are integrated with transport demand models, which provide important input for the assessment of impacts of the various measures considered in the planning process.

Below follows for each of the three countries, a brief description of the current transport planning system and a review of the overall methodological approach to strategic transport planning and the evaluation methods applied.

### **3.2 Country Experience Denmark**

Strategic transport planning in Denmark is still primarily based on a sectoral approach. The Government has already developed most of the framework for an objective-oriented cross-sectoral system. The preparation of transport sector objectives and overall sector strategies (Trafikministeriet 1993a) and the formulation of a national transport policy (Trafikministeriet 1993b) were important steps in this direction. A recent report from the Transport Council outlines elements of a more comprehensive framework for an objective-oriented planning system, which in principle should be extended to include all transport modes (Transportrådet, 1999).

The Danish national road agency has developed an overall plan for investment in the national road network. The road agency has also developed a transport demand model that can be adapted to various elements of the network and applies cost-benefit analysis for evaluation of new projects (Leleur, S.). The Danish railway track agency more recently also applies cost-benefit analysis for project evaluation. It seems that the CBA method applied by the agency is not completely compatible with the corresponding method applied by the road agency.

It appears, against the above background, that the transport planning system currently applied in Denmark is more project-oriented and less strategy-oriented than in the other Scandinavian countries. This may, partly, be due to the difference in planning situation. The major strategic decision-making problems in Denmark have until recently been connected to the huge strait crossing projects across the Great Belt and Øresund and a new huge fixed link to Germany across the Femer Belt is now on the planning agenda. Additionally, the Danish national road network (state roads) currently constitutes and has also in the past decades constituted a less dominant part of the transport system than elsewhere in Scandinavia. The need for and possibly also the resources available for developing complex strategic road planning systems may, therefore, not have been the same in Denmark as in the other two countries. It was, as indicated in Section 2 above, strategic road planning that paved the way for strategic transport planning and the methodological approach developed for the road sector was subsequently transferred to cross-sectoral transport planning in Norway and Sweden.

### **3.3 Country Experience Norway**

Current national strategic transport planning in Norway is based on a third generation concept. The planning is objective-oriented ("public management by objectives"), all transport modes and all national transport agencies are included in a joint planning process. Measures shall, in principle, be prioritised across the sectors. The planners shall develop alternative strategies by combining measures from all four sectors and also propose a recommended strategy. Subsequent to this, the politicians shall decide on a strategy for development of the sector and the strategy shall provide the framework for implementation of measures controlled by the national transport agencies.

The current planning exercise, National Transport Plan 2002-2011, started in 1998. The Ministry of Transport and Communications and the Ministry of Fishery issued guidelines for a joint planning process including the four national transport agencies responsible for sectors of respectively air, rail, road and sea transport. The first three reports to the Ministry of Transport and Communications and the latter to the Ministry of Fishery.

The planning guidelines emphasised close co-operation between the agencies and that the planning process should be open and transparent and involve the various stakeholders. They also indicated a planning process where the agencies should develop four alternative strategies including the various policy measures available to them: An environmental strategy, a transport safety strategy, a regional development strategy and a strategy for efficient traffic flow. In addition to the four optional strategies, the agencies should prepare a recommended strategy. All strategies should be evaluated across the transport sectors and their impacts assessed in respect of a set of criteria defined in the guidelines (Sekretariatet for Nasjonal transportplan). The regional level was drawn into the early stages of the process and each county was requested to deliver a planning document on current problems and challenges as seen from their perspective (Stenstadvold, M. and Lerstang, T.)

The planning document prepared by the agencies should provide the framework for the subsequent strategic and comprehensive political decisions aimed at improving efficiency in the transport sector and strengthening the interplay between the transport modes.

The agencies delivered their planning report (Sekretariatet for Nasjonal transportplan) in September 1999 and the initial schedule for the political process was based on that the ministries prepared a white paper and that Parliament discussed the issues and decided on a strategy during the first half of 2000. This schedule has been revised and the white paper was published in September 2000 (Samferdselsdepartementet). The white paper reviews the issues of the planning report from the agencies and presents a recommended strategy for the consideration of the politicians. The strategy proposed by the white paper is more detailed and specific than the one presented by the agencies, particularly in respect of the investment programme, which, for instance, mentions major investment projects in the various sectors and indicates financial allocations for trunk roads in the national corridors.

The next stage will be the political process in Parliament scheduled for early 2001. Subsequent to this, the agencies shall prepare more detailed action plans, i.e. implementation programmes for the period 2002-2011. The implementation programmes will be more detailed for the first four years (2002-2005) than for the last six years. The white paper specifies that the four agencies are responsible for preparing their own implementation programme. The agencies shall, however, co-ordinate their programme based on the outcome of the political process. The programmes shall also be submitted to the regional level for comments.

The National Transport Plan is a rolling planning system with four years intervals. The approach for the next planning round, which will cover the period 2006-2015, is therefore already being discussed.

It appears from the above description, that the methodological approach to national strategic transport planning in Norway is highly process-oriented and it is based on system analysis. The methods applied for evaluation include cost-benefit analysis and multi-criteria analysis and the input to these methods are provided through a variety of other methods and tools, among them national transport demand models and various methods for impact analysis.

A number of ex post evaluations of the current process have been carried out or are planned. Such evaluations are carried out systematically to gain experience and to facilitate further improvement of the planning system. The following ex post evaluation studies related to the current planning process have been completed or are being planned:

- Evaluation of the planning process at the regional level: Completed and documented 1999 (Stenstadvold, M. and Lerstang, T.)
- Evaluation of the joint planning process of the national transport agencies: Completed and documented 2000 (Ravlum, I. A.)
- Evaluation of the political decision-making process in Parliament: Ongoing

- Evaluation of the implementation programming of the national transport agencies: Proposed for 2001

In addition, a comparative study of the ex post evaluations of the planning processes in Norway and Sweden is being carried out. The second of the above evaluation studies is described in more detail in Section 4.2 below.

### **3.4 Country Experience Sweden**

Sweden has substantial experience with national strategic transport planning and the current planning exercise represents a second round based on the same third generation concept as applied for the first round. The planning is objective-oriented and considerable efforts have recently been put into formulating the national transport policy and in making the objectives defined by Parliament operational in a planning context (Kommunikationsdepartementet). All transport modes and national transport agencies are included in a joint planning process. The measures controlled by the agencies shall, in principle, be prioritised across the sectors. The planners shall develop alternative strategies by combining measures from all four sectors. Subsequent to this, the politicians shall consider the optional strategies and, finally, decide on the strategy for development of the sector. This strategy shall provide the framework for implementation of measures controlled by the national transport agencies.

This implies a planning system that at the conceptual level is very similar to the Norwegian system as described in Section 3.3 above. There are, however, some and possibly quite important differences in the planning and evaluation approach. Another interesting difference is that much more efforts have been put into developing national and regional demand models and corresponding evaluation methods in Sweden than in Norway.

The strategic transport planning system in Sweden is divided into two phases. The first comprises an analysis of the current situation and the second is the so-called strategic analysis, which again comprises two different components. Accordingly, the present planning round started with the situation analysis, which was undertaken in 1998 by the Swedish Institute for Transport and Communications Analysis (SIKA) assisted by the four national transport agencies (SIKA, 1998). The report on the first phase also includes a review of the result of the previous planning round and a summary of various ex post evaluations made by transport agencies and other bodies involved in or having an interest in the planning process. The report recommended that a number of analyses of special strategic issues be included in the second phase.

The second phase was based on planning guidelines issued by the Government. The guidelines stated that the strategic analysis should investigate three different strategic development options or strategy alternatives: The Socio-economic (most efficient) Alternative, The Road Safety and Environment Alternative and The Regional Development Alternative. In addition, the planners should undertake analyses of 12 specific strategic issues. The results of the latter analyses should provide the framework for developing the three national alternatives.



The strategic analysis should be carried out jointly by the Swedish Institute for Transport and Communications Analysis (SIKA) and the four national Swedish transport agencies responsible for air, rail, road and sea transport. The analysis should provide the background for the Government's proposal to Parliament on strategies for development of transport infrastructure for the period 2002-2011.

At the same time, county authorities were directed by Government to develop regional development packages of transport measures aimed at promoting development of local and regional industries. These packages should again provide the building blocks for the above national strategy called The Regional Development Alternative.

The agencies delivered their planning report in November 1999 (SAMPLAN). After that, the Swedish process appears to have halted, and the Government's proposal to Parliament on strategies for development of transport infrastructure is still pending. The political process has therefore not yet started.

Subsequent to the political process, the agencies should prepare more detailed implementation plans for the period 2002-2011. It is not clear at this stage how this process will proceed without the planned political guidance.

The Swedish transport plan is a rolling planning system with four years intervals. The development of the approach for the next planning round should commence in the near future. The absence of political decisions, however, makes this more difficult.

The methodological approach to national strategic transport planning in Sweden is even more comprehensive than in Norway. It is clearly process-oriented and based on system analysis. The methods applied for evaluation include cost-benefit analysis and elements of multi-criteria analysis. The input to these analyses are provided through a variety of other methods and tools, among them national transport demand models, regional transport demand models and various methods for impact analysis. The methods are currently being streamlined and integrated. The output from the demand models will, for instance, in future feed directly into the cost-benefit method.

There is a tradition in Sweden for carrying out systematic ex post evaluations. A number of such studies were carried out for the previous planning round. Some are presented in Sub-section 6.2 below. Recently, two ex post evaluation studies concerning the current planning round have been completed:

- Evaluation of the planning process at the national and regional level (Lauridsen, H. and Ravlum, I. A., 2000a)
- Evaluation of the analyses of strategic issues and the decision-basis for measures (Larsen, O. I. and Rekdal, J.)

The above two ex post evaluation studies are described in more detail in Section 5 and Section 6 below.

### 3.5 An Overview

The table below summarises the description of the planning concepts and the different types of methodology currently applied in the Denmark, Norway and Sweden for national strategic transport planning.

*Table 1 Overview of Planning Concept Features, Evaluation Approaches and Methods for National Strategic Transport Planning in Scandinavia*

Level	Item	Denmark	Norway	Sweden
1) Planning concept	Objective-oriented	x	x	x
	Strategy-oriented		x	x
	Project-oriented	x		
	Cross-sectoral		x	x
2) Approach	Process-oriented	(x)	x	x
	System analysis		x	x
3) Methods & supporting tools	Cost-benefit analysis	x	x	x
	Multi-criteria analysis	(x)	x	(x)
	Impact analysis	x	x	x
	National transport demand models		x	x
	Regional transport demand models			x
	Other demand models	x		

The table clearly shows the similarities between the planning and evaluation systems in Norway and Sweden and the somewhat different situation in Denmark. If we had included ex post evaluation, the differences would have become even stronger.

Ex post evaluation studies are currently applied systematically for learning by experience in Norway and Sweden but not in Denmark. The results of the studies contribute to more systematic improvements of the planning system and the evaluation methodologies. There are two main types, the one evaluating the planning process and the other investigating the various evaluation methods and their use. The contents and results of the most important evaluation studies on strategic transport planning in Scandinavia are summarised in Sections 4-6 below.

## **4 Ex post Evaluations of National Planning Processes in Norway**

This section is based on two ex post evaluation studies. The first dealt with the political process of the Norwegian Road and Road Traffic Plan 1998-2007. The second looked into the joint planning process of transport agencies concerning the National Transport Plan 2002-2011.

### **4.1 The Norwegian Road and Road Traffic Plan 1998-2007**

The Norwegian Road and Road Traffic Plan for the period 1998-2007 was presented in a white paper to Parliament in 1997. This was the first Norwegian example on a national transport policy document cum investment plan aimed at providing the background for a strategic decision-making process in Parliament. The document presented goals and objectives for the sector, described the measures required for achieving the objectives and described the results of calculations made for demonstrating the impacts of the various policy options or strategies. Based on this, the members of Parliament and, especially, the members of the Standing Committee on Transport and Communications, were expected to make more rational and intentional decisions. The strategies or policy options were presented as four alternative packages of investment projects and other measures, namely a strategy for more efficient traffic flow, a strategy for reducing negative environmental impacts, a strategy for improved traffic safety and, finally, one for rural development. The policy part of the white paper was much more comprehensive and the investment plan was less detailed than in previous plans in order to give the decision-makers a better basis for policy discussions and prevent detailed discussions at project level.

An ex post evaluation study of the planning process was carried out subsequent to the political discussion in Parliament (Ravlum, I. A. and Stenstadvold, M.) The aim of the study was to examine:

- Whether the political process in Parliament was in accordance with the intention of a more goal and policy oriented process with less focus on individual projects
- Whether the members of the Standing Committee on Transport and Communications found the white paper adequate and useful as a basis for policy decision

The study was based on semi-structured interviews with seven out of 14 members of the Standing Committee. All political parties in the Committee were represented.

#### **4.1.1 The Decision-making Process should be Policy-oriented and Cross-sectoral**

The study showed that the politicians generally were satisfied with a less detailed plan. The majority would prefer a more policy oriented and even less detailed investment plan as background for the political discussion and decision. This was, however, subject to that politicians had real influence over the policy framework and that there was a clear linkage between policy decisions made at the political level and the subsequent implementation by the road agency. The politicians further felt that a more comprehensive policy framework should include all modes of transport (air, rail, road and sea transport) as well as public transport. Such framework would facilitate a policy-oriented process by widening the latitude for political decisions and facilitate prioritising among transport modes. It would also make more measures available for a comprehensive political assessment.

The politicians emphasised the need for an institutional framework that could support a comprehensive policy approach. This would include a better division of labour between the national authorities and the regional authorities, thereby securing a more optimal resource allocation between the modes of transport. Further, such framework would secure that the needs for public transport were taken better into account, whereby public transport to a higher degree could become an alternative solution to car transport.

#### **4.1.2 The Decision-making Process should be more Objective-oriented**

The ideal model for rational planning and decision-making includes several elements. It starts with definition of goals and objectives based on the problems at hand. This is followed by a search for the most effective measures to achieve the objectives and finally selection of those actions, which within available financial resources most efficiently fulfils the desired ends. In this sense the white paper on the National Road and Road Traffic Plan was not conducive to a rational political decision-making process in the Standing Committee on Transport and Communications.

This was mainly due to the presentation in the white paper, which described the alternative transport strategies partly in isolation from the proposed policy measures and the investment plan. This made it difficult to see the internal logic from the strategies to the various measures and actions selected for inclusion in the plan. It appeared that the politicians, therefore, decided on the components of the investment plan and made policy recommendations without taking the strategies into account. They were rational policy-makers in the sense that their decisions reflected the lowest possible cost. The strategies presented in the plan were, therefore, not used as intended but became more superficial elements in the ensuing hectic decision-making process.

Other factors also contributed to marginalising the alternative strategies in the political process. The white paper was presented to Parliament only weeks before an election campaign began. This contributed to that the politicians took party-interests more into account than otherwise and, therefore, put less emphasis on the new approach. Further, the Standing Committee had only a few weeks to consider

and discuss the white paper. This did not make it easier for the politicians to familiarise themselves with the new planning approach.

#### **4.1.3 Main Conclusions**

Two main conclusions emerge from the ex post evaluation of the political decision-making process as described above. The first is that the white paper on the national road and road traffic plan was not adequate in respect of providing a sufficient basis for a more rational political decision-making process. That is a process, which includes selection of those measures that most effectively meet the objectives defined and the actions that most efficiently fulfil the desired ends. On the other hand, the plan did encourage a less detail-oriented approach, which, however, was not considered comprehensive enough by the politicians.

The other main conclusion is that other factors, beyond the contents of the plan, also contributed to a less rational planning process than what was intended. Two factors, in particular, were important in this respect. The plan was presented only weeks before the beginning of an election campaign and, secondly, there were tight overall time constraints for the political process.

### **4.2 The National Transport Plan 2002-2011**

The four national transport agencies responsible for air, road, rail and sea transport in Norway were in 1998 directed by the Ministry of Transport and Communications and the Ministry of Fishery to prepare a joint proposal for a long-term national transport plan for the period 2002-2011. An ex post evaluation study of the joint strategic planning process was carried out in 2000 (Ravlum I. A.). Below follows a presentation of the study and its main conclusions.

#### **4.2.1 Background and Planning Approach**

The planning guidelines from the two ministries emphasised the need for close co-operation between the agencies throughout the planning process and that the planning process should be open and transparent and involve the various stakeholders. The guidelines stated that the planning document should provide the background for strategic and comprehensive political decisions aimed at improving efficiency in the transport sector and strengthening the interplay between the transport modes.

The planning approach was specified in the guidelines. The agencies should develop four alternative strategies taking into account the various policy measures available to them: An environmental strategy, a road safety strategy, a rural development strategy and a strategy aimed at more efficient traffic flow. In addition, the agencies should prepare a recommended strategy. All strategies should be evaluated across the transport sectors and their impacts assessed in respect of the criteria defined in the guidelines.

#### 4.2.2 Main Study Areas

The ex post evaluation study of the strategic planning process looked into the following three main questions:

- To what extent was the process characterised by real co-operation between the transport agencies (including evaluation of measures and effectiveness across sectors), transparency and involvement of the various stakeholders?
- Which factors contributed to the actual planning process?
- Which factors could contribute further to real co-operation between the agencies and cross-sectoral effectiveness?

Co-operation during a joint planning process requires more than that the agencies merely sit together. It also implies a process where the parties do something they would otherwise not do. The basic level of co-operation is to develop and formulate a common understanding of problems and conditions in the transport sector. A higher level is achieved when the agencies try to develop a common policy involving their own core interests, among them allocation of financial resources, co-ordination of their measures and mutual adaptation of their plans to each other. The term co-operation between agencies, finally, implies that the joint planning process is integrated into each agency's organisation and that corporate management is involved.

#### 4.2.3 Study Approach

The evaluation of the planning process was based on semi-structured interviews of 25 interviewees from the four transport agencies and the two ministries involved. The interviewees were selected in such way that they represented all working groups established to work on the National Transport Plan proposal. In addition, administrative and political representatives from the regional level and some of the largest cities were interviewed.

#### 4.2.4 Main Conclusions

##### *The Agencies did co-operate to a certain Extent*

The four transport agencies did work together to establish a common understanding of the problems, to prepare a common description of conditions in the transport sector and to generate the four alternative strategies. The recommended strategy, however, was developed sector by sector and separately in each agency without involvement of other agencies. With the exception of the more general policy statements, the joint recommended strategy, consequently, became a product of four sector plans rather than a product of a joint process.

The study concluded that the actual co-operation primarily was one of presenting general transport policy principles, rather than mutual scrutinising of each agency's measures and means. On the other hand, the alternative strategies, which illustrate how policy measures could be combined in different ways, were worked out through discussions between the railway track agency and the road agency.

The road agency integrated the planning process into its normal planning procedures, involving both corporate management and the organisation as such. Also the railway track agency involved its organisation in the planning process, although it had less capacity in respect of human resources than the road agency. The coastal transport agency was eager to participate in the planning process, but has less experience in strategic planning and less capacity than the other agencies. The civil aviation agency had fewer interests in common with the other three agencies and did not prioritise the work as much as they did.

#### *Limited Cross-sectoral Evaluation*

The agencies agreed at an early stage that they did not have the necessary quantitative methods and planning tools to assess the effectiveness of their measures across the transport sectors. They did, however, not agree on using more qualitative methods for cross-sectoral evaluation. This reluctance in regard to qualitative methods was due to a disagreement on how much competition there was among the transport modes.

The agencies were not able to evaluate impacts in a comparable way. The coastal and civil aviation agencies were not able to assess impacts at all. They faced, additionally, problems in handling intermodal transport in a satisfactory way. Consequently, the planning process did not come very far in assessing gains from co-ordination and overall effectiveness across transport modes. Several interviewees claimed that the agencies could have done more in this respect. The agencies felt, however, that it would be difficult to agree on such an overall assessment due to lack of appropriate methods and a mutually agreed knowledge basis.

#### *More Transparency and more Involvement of Some Stakeholders*

Stakeholders that usually were not in close touch with the transport agencies and the planning process felt they had gained more influence through participation in an external reference group. On the other hand, non-transport government agencies that also participated in the reference group found that involvement, at the same level as the NGO's, reduced their formal position as government agencies. Regional and local authorities and politicians found the process more transparent and participatory than previously, even though the regional input did not have any significant influence on the resulting national priorities.

#### *Institutional Differences cause conflicting Interests and Unequal Power*

The road agency's previous experience with this type of strategic planning gave this agency the stronger position. Budget size, human resources and many interests at stake were all factors that contributed to strengthening this agency's position as *primus inter pares* in the process. The rail agency was the second strongest agency. Most discussions took place between these two agencies, which also carried out most of the planning work. The coastal agency scored lowest on the institutional variables, even though it was the civil aviation agency that

participated least in the co-operative process. The latter agency is self-financing through user fees. Less dependence on government funding combined with a relatively autonomous status may explain the low level of participation of the civil aviation agency.

It appears that the agencies to a great extent behaved in accordance with their institutional characteristics. The civil aviation agency had least interests at stake in the process and was least involved. The coastal agency had limited capacity and resources and could, therefore, not participate as actively as it wanted. Most discussions took place between the strongest agencies, namely the road agency and the rail agency, with the former and stronger as the lead partner.

#### *The Planning Guidelines may have amplified Institutional Differences*

The planning approach of the guidelines did not suit the civil aviation and the coastal agencies too well. Neither of them was able to assess the impacts of their own measures or differentiate their means into alternative strategies. The guidelines assigned the formal leading and co-ordinating role and the responsibility as planning secretariat to the road agency. This might have had a positive as well as a negative effect on the agency's ability to promote its own interests. The leading role gave the agency an opportunity to put its stamp on the work at an early stage. On the other hand, this role also entailed responsibility for promoting joint interests. Disagreements among the agencies, for instance on definitions and on what should be included in the joint planning process, strengthened the civil aviation agency's initial reserved attitude to the process.

Most interviewees felt the recommended plan should have included measures beyond the control of the four agencies. The agencies described such measures in the more general part of the planning document and were not given unlimited opportunities to base the recommended strategy on policy conditions not already approved by the ministries or Parliament. Such restrictions may have forced the agencies to focus on their own contributions and measures to achieve the transport policy objectives. The possibility of including other measures could have shifted attention away from the measures controlled by the agencies. The transport policy objectives were, on the other hand, quite ambitious and broadly defined by the ministries. This created a gap between objectives and measures available to achieve them.

#### *Factors that might improve the Planning Process*

The evaluation study included a review of factors that may contribute to further improve the planning process.

The transport policy objectives that the agencies were asked to achieve, should have been more in line with the measures the agencies actually control. Moreover, too widely defined and partly inconsistent transport policy objectives may draw attention away from measures controlled by the agencies towards policy measures controlled by others.



In spite of the short time available, the agencies could have put more emphasis on co-ordinating their recommended strategies and not only the more general policy aspects. They did not scrutinise each other's input. The agencies could have put more emphasis on developing a joint recommended strategy and not merely presented an aggregate of four separate ones. The four alternative strategies should also have been used more directly for developing the recommended strategy.

There was a mismatch between strategic planning and the agencies' tradition of project focus, which lead to a bottom-up rather than a strategic top-down approach. A division of the planning process into a first phase of general policy principles and a second phase of developing alternative and recommended strategies, might be a better solution. This could also pave the way for more relevant involvement of the regional level at an appropriate time in the planning process.

Before the agencies started the planning process, a clearer distinction should have been made between efforts that must be carried out jointly and matters that do not necessarily involve all agencies. A better scheduling of the process could facilitate closer participation of the regional level. The common knowledge basis, especially compatible evaluation methods, needed improvement. Such improvement should take place before the next revision of the plan.

A joint secretariat for the National Transport Plan process that includes staff from all agencies should be considered. Such secretariat should consist of employees holding key positions in the agencies to ensure ownership and agency responsibility for the cross-agency operations. The overall leadership of the planning process should still be placed in the agencies qua agencies. The co-ordination and operational management could be placed in the road agency being the largest and most experienced.

## **5 Ex post Evaluation of the National Transport Planning Process in Sweden**

The Swedish Institute for Transport and Communications Analysis (SIKA) and the four national transport agencies responsible for roads, railway track, civil aviation and sea transport were by Government Decision of 1999 directed to carry out jointly a national strategic analysis. An ex post evaluation of the planning process was carried out late in 1999 (Lauridsen, H. and Ravlum I. A., 2000a).

### **5.1 Background and Objectives of the Study**

The government guidelines stated that the strategic analysis should investigate three different strategic development options (strategic alternatives): A socio-economic (most efficient) alternative, a road safety and environment alternative and a regional development alternative. In addition, analyses of 12 specific strategic areas should be carried out. The results of the latter analyses should provide parts of the background for development of the three national strategic development options. The guidelines also stated that the analysis should provide the background for the Government's proposal to Parliament on strategies for development of transport infrastructure for the period 2002-2011.

County authorities were simultaneously directed to develop regional development packages of transport measures aimed at promoting development of local and regional industries. These packages should again provide the building blocks for the above regional development alternative.

The objectives of the evaluation study defined three main areas of investigation that should be looked into:

1. Was the planning process organised in such way that it promoted comprehensive planning and cross-sectoral assessment, and did the contents of the process facilitate achievement of the goals and objectives of the national transport policy?
2. To which degree were the results of the analyses of the 12 specific strategic areas used when developing the three national strategic options and designing the measures included in these?
3. To which degree were the policy differences between the three strategic options reflected in the measures selected, and how was socio-economic efficiency taken into account when designing measures?

## 5.2 Study Approach

The evaluation was based on semi-structured interviews of 22 selected central and regional participants in the planning process. The interviewees were key planners in the five national bodies responsible for the national plan and in two counties selected for the purpose. The study investigated how these participants perceived the process. Each and every action in the planning process can be perceived and interpreted differently by the various participants. The study focused on identifying and describing a pattern in the answers given by the participants rather than identification of “rights or wrongs” in the various planning situations. The overall aim was to identify and explain which factors contributed to and characterised the actual planning process.

## 5.3 Study Results and Conclusions

### 5.3.1 Organisation of the Planning Process and Comprehensiveness

The assessment of the comprehensiveness of the national planning process in Sweden was related to four possible and increasingly ambitious levels for comprehensive and cross-sectoral planning:

1. Participation of all transport sectors in the planning process
2. Application of cross-sectoral evaluations
3. Cross-sectoral prioritisation
4. Application of a system approach including both investments and other measures

#### *Participation in the Planning Process*

All four national transport authorities participated. Two of them, the civil aviation and the sea transport agencies were, however, only lightly involved and mainly focused on that their areas of responsibility were treated correctly in the planning report.

The planning process at the central level was neither perceived comprehensive or cross-sectoral. The work was characterised by bilateral discussions, mainly between the rail agency and SIKA and the road agency and SIKA. All transport agencies felt that SIKA had the main responsibility for the planning process. SIKA was also predominant in respect of report writing.

#### *Cross-sectoral Evaluations*

Application of transport demand models and socio-economic analyses should in principle enable evaluation of measures across the transport modes against each other. The demand models were, however, not fully developed and operational as

scheduled and socio-economic analyses of investment projects could therefore not be completed within the time limit. No corridor analyses were carried out.

#### *Cross-sectoral Prioritisation*

It was intended to use marginal cost principles to establish the financial frameworks for railway investment projects and road investment projects respectively. Due to the delay in model development, such calculations could not be undertaken. The overall allocation to rail and road investments was instead based on a negotiation approach, which led to a result very close to the previous allocations to the two modes. Prioritisation among modes was therefore not based on the intended analytical approach.

#### *System Approach including both Investments and Other Measures*

The resulting planning report includes various general cross-sectoral analyses. The national analysis and the development of the three strategic options were, however, mainly limited to projects and measures that are controlled by the transport authorities. Subsidies to public transport as a measure, which can reduce the need for investment in infrastructure projects, was not considered when designing the three strategic development options. This measure was, however, discussed in general for urban areas in one of the analyses of specific strategic areas.

#### *Work at the Regional Level*

The planning process at the regional level had a somewhat different character. It was more geographically specific and more problem-oriented. The regional level looked to some extent into transport corridors and major projects. It appeared as a somewhat more comprehensive process than the process at the national level but it was less analytical and less focused on strategic considerations.

### **5.3.2 Use of Results from the Analyses of the 12 Specific Strategic Areas**

Three criteria related to the analysis of and use of results from the strategic areas were established:

1. Carried out jointly by representatives from more than one transport agency
2. Conclusions were to a reasonable degree agreed among the parties and accepted as a basis for developing the national strategic options;
3. Conclusions have had an impact on the development of strategic options.

The analyses of strategic areas had to a varying degree an impact on the actual development of national strategic options. At the regional level, knowledge about the results was very scarce.

Four analyses, which concerned development scenarios for society, policy on CO<sub>2</sub> emissions and transport demand for passenger and freight traffic, were particularly

important as they provided a common basis for the three national strategic options. The work was carried out jointly by the transport authorities, and the results were agreed. Disagreement was limited to the use of the results, notably whether a new CO<sub>2</sub>-levy on fuel should be introduced.

In the analysis of road safety, the application of a CO<sub>2</sub>-levy and speed limitations compared to use of other and less controversial measures was discussed intensely, but a common agreement in this respect was not reached. This analysis became, however, highly important for design of the road safety measures used in at least two of the strategic options.

Two railway related analyses were carried out by the rail agency and other agencies were only marginally involved. The results were not commonly agreed. The analysis was important for the railways, but it had no clear impact on the development of the three strategic options.

All parties were satisfied with the analysis of port structure and sea transport. It had, however, no notable impact on the development of the strategic options.

The analysis on maintenance of road and railway infrastructure had a strong impact on the development and design of two of the strategic options. There was, however, a common understanding of that the results concerning the optimal road maintenance level were tentative and that further research in this respect was needed.

It appears that the various analyses to a varying degree met the above criteria. This reflects to some extent the limited time available for the analyses (Larsen, O. I. and Rekdal, J.). The analyses represented a new and useful element in the Swedish planning system, and there appears to be a need for more focus and professional emphasis on them in future. Some are highly critical for prioritisation among the various categories of measures in the final strategic plan, in particular the balance between investment and maintenance of infrastructure.

### **5.3.3 Were Policy Differences reflected in Measures selected and was Socio-economic Efficiency taken into Account?**

The captioned questions were assessed under the four headings below:

- Were different planning frameworks applied?
- Were the most efficient measures for achievement of objectives selected?
- Did the design of measures reflect policy differences?
- Was the socio-economic efficiency of measures considered?

#### *Application of Different Frameworks*

The CO<sub>2</sub>-levy and speed limitations were combined with use of shadow prices for the road safety and environment option. Measures selected for this option, therefore, differed from measures selected for the socio-economic option.

### *Selection of Most Efficient Measures for Goal Achievement*

The transport agencies did not explicitly select investment projects that primarily contributed to the achievement of the road safety and environment goals. The investment projects selected for the road safety and environment option were mainly the same as those selected for the socio-economic option. The regional development option differed more and included a wider range of projects. These projects were, however, not selected in such way that they clearly aimed at achieving the regional development goals. The counties did to a high extent give priority to projects that also were prioritised in the previous strategic planning round, although the regional development goals were quite different at that stage.

### *Design of Measures*

The study looked specifically into design of investment projects included in the three options. The project design was fixed and totally independent of the option. There were, however, variations among options for some other measures. The size of the packages of other road safety measures was much larger for the road safety and environment option, and there was less emphasis on infrastructure maintenance in the regional development option than in the other options.

### *Socio-economic Efficiency of Measures*

Delays in transport model development led to that the socio-economic analyses of investment projects were not carried out as planned at the central level. Socio-economic analyses were not used at the regional level.

### *Conclusions*

It appears that transport agencies and counties to a high degree have introduced investment projects that they previously have identified and, which they probably also under other circumstances would have given high priority. If we exclude the CO<sub>2</sub>-levy and speed limitations in the road safety and environment option, differences among options mainly comprise the size of the various packages of measures and to some extent a different order of priority for investment projects. The study was, therefore, not far from concluding that: Strategic options arrive and pass by, whereas investment projects survive.

#### **5.3.4 Which Factors contributed to the Planning Process?**

A number of different categories of variables may have an impact on the planning process and the final plan. The most important are the following three categories:

1. Guidelines for the planning process
2. The planning agencies' interpretation of the Government Decision and the guidelines, the knowledge basis and the way it is interpreted by the planners and, finally, the organisation of the planning process

### 3. The institutional characteristics of the participants

#### *Planning Guidelines*

The general Swedish guidelines for strategic transport planning, which form part of the governments transport policy (Kommunikationsdepartementet) did, obviously, have a major impact on the actual planning process. Both the general guidelines and the government guidelines of 1999 opened, however, for interpretations, and the transport agencies expressed different views on key elements during the process.

#### *Interpretation of the Guidelines*

The national transport agencies and SIKa had extensive discussions on interpretation of the goals and objectives for the transport sector, and the relationship between operational objectives and overall goals, which have not yet been expressed in operational terms. There was also disagreement on how to apply the principle of socio-economic efficiency in the development of the three strategic options. The disagreement was reflected in the discussion on which measures to include in the various strategic options. This applied in particular to measures aimed at achieving sustainable development and road safety.

Both the rail agency and the road agency issued formal written statements of disagreement concerning the design of the road safety and environment option. Some of the interviewees felt that the process rather should have addressed problems than focus on whether solutions are economically beneficial. The disagreement concerning goal interpretation continued throughout the work and was hardly beneficial for the planning process or for smooth co-operation among the parties. In particular, the railway participants felt that their opinions and interests were disregarded.

#### *The Knowledge Basis*

In parallel with the analyses of specific strategic areas, an extensive work on development of transport demand models linked to tools for impact analysis went ahead. The results of the two parallel activities should provide a strong professional knowledge basis for the development of the three strategic options. The model development was, however, not completed in time for active use in this respect.

A number of interviewees emphasised that model development work diverted the focus from other planning approaches, which would have been more relevant for the strategic analysis. It is a paradox that economic analyses of investment projects were emphasised much more than the analysis of maintenance need, which revealed serious methodological shortcomings and which provided the basis for the conclusions related to the far more important package of maintenance measures.

### *Organisation of the Planning Process*

The process was carried out in a short period of time compared to the high professional ambitions. Several of the analyses of strategic areas were completed only just before the completion of the final planning report, and most were carried out in parallel to the development of the strategic options. The development of the models was not completed before publishing of the final report. It is likely that more time would have made it easier to reach agreements on the various controversial matters underway.

All parties involved perceive the process and the results as “owned “ by SIKA. SIKA was the driving force in the process, wrote the report and, partially assisted by the Ministry, acted as a referee with respect to the various disagreements along the way. SIKA and the national transport agencies seem to have chosen somewhat different approaches and roles in the process:

- The civil aviation agency and the sea transport agency were in several respects on the sideline. The two agencies found other decision-making arenas like the regional project planning process more important. They asked whether their participation in the national planning process was too resource demanding in view of the benefits to them
- The rail agency held a position of defence. It did seldom take the initiative and felt that its legitimate points of views were not taken duly into account. The agency was not able to deliver all the contributions requested. The involvement of corporate management was low. The agency had serious problems with the design of the strategic analysis and also with the transport models. It was, however not able to convince the other participants about its alternative way of designing the analysis
- The road agency participated in a “bureaucratic correct” manner, delivering the contributions it was asked to make and having fewer conflicts with SIKA. Corporate management was more involved than that of the rail agency. The road agency had some problems in respect of the design of the national strategic options, particularly the safety and environment alternative, but to a lesser extent than the rail agency. In addition, the road agency, contrary to the rail agency, did expect the strategic analysis to be to their benefit
- SIKA saw its own role as one of scrutinising the policies and priorities of the four transport agencies. Accordingly, such role would easily lead to conflicts with the interests of the other participants.

### *Institutional Characteristics of the Participants*

The study could not fully explain the different ways the participants acted. Some aspects of the institutional and organisational set-up might, however, help explain how the various agencies interpreted their role:

- **Different economic and financial frameworks:** The civil aviation agency and the sea transport agency are self-financed, that is financed through user charges. Consequently, their investment projects or other activities were not as



dependent on the strategic planning process as those of the other two agencies were. In this sense, their interests were not really at stake

- **Different competence:** The rail agency and its employees have less experience of strategic planning. The agency had also experienced a high turnover of planning staff while that of the road agency had been stable
- **Different organisational structure and culture:** The road agency is a larger organisation and the whole organisation is more focused on planning than the rail agency. The road agency has a tradition of top management involvement in national planning. This might have given it more power in negotiations
- **Different perceptions of the political environment:** The road agency felt that politicians were somewhat critical to roads. The strategic analysis might, therefore, have been seen as an appropriate arena for defending the core interests of the agency and it would be rational to put emphasis on the analysis. The rail agency seemed to be more comfortable with the politicians' attitudes to railways and the increasing sector budgets. The agency may therefore, have considered the strategic analysis less crucial for its interests

### **5.3.5 The Planning Process at the Regional Level**

The responsibility for the regional planning process was vested in the county authorities. The other participants looked upon themselves as contributors, emphasising a good relationship with the planners in charge. All participants, however, stressed their ownership of the process and its results. The regional offices of the national road and rail agencies participated most actively in the process. The civil aviation and the sea transport agencies were not actively involved, but the regional planners were nevertheless preoccupied with the role of these transport modes in the planning process.

The regional process appeared to be harmonious without serious disputes. The local planning authorities defined the objectives of the regional development alternative in a way that reflected a common understanding of the regional transport challenges among the participants. The two counties studied had relatively generous financial frameworks for their planning. They had, consequently, not the same need for strict prioritising as at the national level. It appeared that the regional planners mostly did what they were used to. Although the goals for the regional development alternative had changed since the last planning round four years earlier, the contents of the regional plans did not change substantially.

## **6 Ex post Evaluation of Methods and Planning Tools in Sweden**

Several ex post evaluation studies of specific evaluation methods and planning tools have been carried out in Sweden the last few years. Two relate to the current planning process whereas others relate to the previous planning round, which in principle was almost identical to the current.

Below follows a review of experience from the studies. The first concerns methods for analysis of strategic issues, whereas the other three concern cost-benefit methods and related planning tools.

### **6.1 Methods for Analysis of Strategic Issues**

The second phase of the current strategic transport planning process in Sweden comprised two main elements. One was the traditional analysis of three different strategic development options, which in different ways reflected the objectives defined in the national transport policy. The other element comprised analyses of 12 specific strategic issues. The results of the latter analyses should provide part of the framework for developing the three national strategy alternatives. The evaluation of the planning process as described in Section 5 above investigated to which extent the results of the 12 analyses had an impact on the analysis of alternative strategies. An additional ex post evaluation as described in this section investigated the methods applied for four of the most crucial strategic issues: Maintenance of infrastructure, transport safety measures, passenger transport demand and supply and system analysis of railways and increased train speed (Larsen, O. I. and Rekdal, J.). The conclusions of this evaluation study are described below.

The results of the first two analyses of maintenance of infrastructure and transport safety measures were highly important for allocation of financial resources to the various categories of measures included in the alternative strategies. The maintenance analyses had a direct bearing on the socio-economic (most efficient) alternative whereas the transport safety measures analysis was particularly important for the safety and environment alternative.

The evaluation of the maintenance analyses concluded that the results could only be considered tentative, as the method was not fully developed at the time. More knowledge based on on-going research is required. It is only when such knowledge becomes available, that a professionally sound evaluation of the future need for maintenance can take place. The issue is highly important, as transport

infrastructure maintenance in Sweden is becoming the major component in future budgets. The plan for the 2002-2011 period showed that the infrastructure maintenance component amounted to approximately 60 per cent of the total financial resources allocated for infrastructure, i.e. considerably more than for investment projects.

The evaluation of the analysis of transport safety measures concluded that the analysis primarily focused on road safety and did not fully address the safety problems in other sectors. The socio-economic evaluation of the various categories of measures was not considered fully adequate. The question of speed reductions as a road safety measure, which was debated all over the country at that time, was not analysed as meticulously as it deserved, not least because this measure is inexpensive and easy to implement.

The passenger transport evaluation concluded that the analysis of supply and demand for passenger transport is professionally sound. It appears that the forecast results, which were based on the new national passenger transport model, were in the same range as similar results based on other models.

The evaluation of the system analysis for railways and increased train speed concluded that the system analysis presents a clear overview of the situation and identifies relevant bottlenecks for passenger and freight transport. The analysis was, however, weak in respect of demand analysis. This was particularly critical because the railway track agency after the splitting of the former railways into a track agency and an operating company is even more dependent on reliable data for transport demand.

The ex post evaluation of the four analyses of strategic issues indicates that there is considerable room for improvement of the methods applied. This is particularly critical for the analysis of infrastructure maintenance where the deficiencies are so prominent that the results can only be considered tentative. The evaluation also revealed that the results of two of the analyses were highly important for the design of the alternative strategies.

## **6.2 Cost-benefit Methods and other related Planning Tools**

The decision-making basis for measures considered for inclusion in the Swedish strategic transport plans has been evaluated both for the current plan and the previous plan. A comparison of the two set of conclusions reveals that there has been some progress in respect of methods from the previous to the present planning process, particularly for the railway sector. Fundamental problems concerning input data for the cost-benefit evaluation, however, remain.

### **6.2.1 The Decision-basis for Measures included in the Current Plan**

A recent ex post evaluation study has investigated the decision-basis for measures included in the current national strategic transport plan 2002-2011. The study focused on investment projects that were considered for inclusion in the various

alternative strategies that were developed during the planning process (Larsen, O. I. and Rekdal, J.). The evaluation looked specifically at road and railway projects.

The national road agency has developed a sophisticated evaluation method for road projects, the so-called EVA-method, which is based on cost-benefit techniques. The evaluation pointed at that the current EVA version is based on a fairly long calculation period of 60 years and a low internal rate of return, namely 4 per cent. This implies that the results depend very much on benefits in a far and rather uncertain future. The method is project-oriented and based on the assumption that the project analysed may have impacts on the choice of route but not on traffic generation. The method is based on free flow of traffic and is not suitable for evaluation of congested road networks.

The EVA-method does not include a traffic demand component. The results of the calculations are therefore heavily dependent on the quality of traffic input. The Evaluation revealed that the traffic data used appeared to be of highly varying quality and that it was almost impossible for others to control the quality at a later stage. It also appeared that the calculations of road safety benefits were subjected to ad hoc adjustments.

The railway track agency did not have such well-developed cost-benefit method as that of the road agency. The evaluation study concluded that the principles applied for cost-benefit calculations, nevertheless, were sound. The same questions concerning the long calculation period of 60 years and the low internal rate of return were raised as for the road sector. The major weakness identified for the railway sector was the same as for the road sector, namely the quality of the input, in particular the traffic data.

The overall impression from the above ex post evaluations is that the methods for cost-benefit analysis as such appear to be sound and sufficient for the purpose. Questions raised concern primarily current practises in Sweden and principles like the length of the calculation period and the internal rate of return. A more serious question, however, concerns the quality of the input data, in particular the traffic data. It may, therefore, at this stage be more important to improve traffic data and to introduce a reliable system for documentation of such data than to improve the methods for cost-benefit analysis.

### **6.2.2 The Decision-basis for Measures included in the Previous Plan**

The two most important Swedish ex post evaluations of the decision-basis related to measures were carried out by the Auditor General and the Swedish Institute for Transport and Communications Analysis (SIKA) subsequent to the previous planning process. Both focus, in particular, on the quality of the socio-economic evaluations of investment projects.

The Auditor General's evaluation concluded that the road agency's socio-economic evaluations had been carried out systematically with the same computer based method for most investment projects and that they were fairly easy to comprehend (Riksrevisionsverket). The evaluation report pointed at and was sceptical to that the road agency had increased the calculation period from 40 to 60 years, thereby increasing the benefit-cost ratio. It was further critical to various

supplementary corrections that were made to the basic calculations. These corrections also tended to increase the benefit-cost ratio.

The evaluation was even more critical to the rail agency's socio-economic evaluations, which appeared open for contradictory interpretations. There was considerable doubt about the quality of the assessment of savings of time for rail freight transport. The Auditor General's evaluation strongly recommended that input data be documented systematically and that a uniform method for socio-economic evaluations be developed by the rail agency.

The other ex post evaluation study looked into some of the details of the cost-benefit evaluation methods (SIKA, 1996). It was generally positive to the road agency's evaluation method but emphasised that the agency should be more critical to the road standard applied in the calculation. There is a risk that roads otherwise may be built with an excessive standard. The evaluation recommended that road projects be assessed section by section in order to avoid that sections with high benefit-cost ratios subsidise sections with low ratios.

The other evaluation was also fairly critical to the cost-benefit evaluations carried out by the rail agency. It pointed at that railway capacity consistently may have been underestimated and that the time values applied for railway cost-benefit evaluations in Sweden were high. The evaluation was sceptical to a range of assumptions made and to the way the calculations had been carried out. It even mentioned that the results might have been systematically flawed.

The general impression from the two ex post evaluations is that the method for cost-benefit analysis applied by the road agency appears to be sound and adequate for the purpose. The practical application of the method, however, raised some questions, among them the length of the calculation period, the road standard and the length of the road sections considered. More serious questions were raised concerning the railway sector. The method applied may not be sound and the results may be flawed. There was, consequently, an obvious need for improving the rail agency's method for cost-benefit analysis.

## **7 Do Current Methods address Strategic Planning Needs?**

This section presents the discussion and conclusions on how current methods applied in Scandinavia and, particularly, in Norway and Sweden address the strategic planning needs. The review of conceptual frameworks for strategic transport planning (Section 2) and the description of current evaluation methodology (Section 3) provide the background for discussion. The results of recent ex post evaluation studies (Sections 4-6) provide an overview of actual achievements. Reference is also made to a paper on the Norwegian and Swedish planning process evaluations that identifies some questions for further discussion (Lauridsen, H. and Ravlum, I. A., 2000b).

The aim of the discussion is to assess the relevance of the planning concept and the methodological approach applied in Scandinavia. Further, to identify possible improvements and to establish whether they can be achieved through extending existing methodologies or whether new methodologies are needed.

The discussion is structured in a number of main issues. The current conceptual framework for strategic transport planning implies that the planning approach and process shall be objective-oriented, strategy-oriented and cross-sectoral. This leads to questions about the quality of the process and about prioritisation across the sectors. Another question in respect of the planning approach is the possible use of analyses of specific strategic issues, which played an important role in the Swedish approach. A main question concerning evaluation methodology is how the various methods performed in the actual planning situations? Further, there are two questions of more fundamental character, namely: which actions and measures should be taken into account in strategic transport planning and what is the role of the regional level in the national planning process. This leads to the following list of items:

- The quality of the planning process and the methodological approach
- Prioritisation across sectors
- Analysis of specific strategic issues
- Performance of the evaluation methods
- Which actions and measures should be considered?
- The role of the regional level in national strategic transport planning

Below follows in Sub-sections 7.1-7.6 the discussion and conclusions concerning each of the above issues.

## **7.1 The Quality of the Planning Process**

The conceptual framework developed over the last three decades in Scandinavia provides a set of requirements for national strategic transport planning. Current requirements are that the planning system must be objective-oriented, strategy-oriented as well as comprehensive and cross-sectoral. The ex post evaluation studies indicate that planning systems, which are designed to meet these requirements, necessarily become quite complex and time consuming. The studies also show that the institutional characteristics of the planning agencies involved are important factors in the planning process.

### **7.1.1 Objective-oriented**

The current planning systems in Scandinavia are objective-oriented ("public management by objectives") and there has been a consistent move in this direction for a long time. There is, consequently, much experience with this approach and it seems to work well. The ex post evaluations in Norway and Sweden, however, show that the objectives should be operational and as consistent as possible. If there is much room for interpretation, the planning agencies may easily spend much time on discussions and eventually even disagree on how to interpret the objectives. The establishing of a consistent set of objectives is a major challenge for the transport sector and for the politicians. It is also a challenge to define objectives that are valid over time or alternatively to indicate how objectives may change with development in society at large.

Another main question is how realistic the objectives are or should be, for instance, if they within a reasonable time perspective can be achieved with the actions and measures that are controlled by the planners. Experience from Norway showed that the objectives defined were very ambitious compared to the measures available. The objectives could therefore only be met, if measures beyond the control of the planners were used. The Swedish process was less restrictive in selection of measures. One of the strategic alternatives in Sweden was based on a general CO<sub>2</sub>-levy, which definitely was beyond the control of the transport sector.

It appears as a general rule, that the transport policy objectives, which the planning agencies shall respond to in the planning process, preferably should be in line with the actions and measures the agencies control and that it should be possible to achieve the objectives within a foreseeable time perspective. Too widely defined, too ambitious and partly inconsistent transport policy objectives can create frustration among planners. It can also divert attention from measures controlled by the agencies towards measures controlled by others, which again can reduce the will to make hard choices among their own measures. Government may of course consciously wish that a wider range of measures be considered in a planning situation and should, in case, explicitly indicate this in the planning guidelines.

### **7.1.2 Strategy-oriented**

The current planning systems in Norway and Sweden are strategy-oriented in the sense that planning agencies are requested to develop alternative strategies. The strategies consist of different combinations of actions and measures. Investment projects are considered particularly important in the planning process and considerable efforts are spent on methods for selecting such projects. The detailed contents of the strategies and the individual projects do not usually appear in the final report as prepared by the planning agencies.

The basic idea behind the strategy concept is that the decision-makers, that is the politicians shall discuss strategies rather than projects and finally select a strategy, which then will provide a framework for the more detailed planning and implementation.

Experience from ex post evaluations shows that there are good reasons to discuss whether this approach to strategy-orientation is the best. It appears that the strategies developed by the planning agencies not necessarily are significantly different in respect of the projects included. This may be due to that the strategies selected are not those best suited for the purpose. Other ways of defining strategies should, therefore, be considered. Further, the little we at this stage know about the political process does not indicate that politicians find the strategies particularly useful in their decision-making process. The strategies may, however, be useful for others such as the Ministry of Transport. If they are well designed, they demonstrate the latitude for decision and that appears useful in any planning situation.

### **7.1.3 Comprehensive and Cross-sectoral**

The principle of comprehensive and cross-sectoral planning implies that the planning process shall include all relevant actions and measures and take all transport modes into account. Experience so far indicates that the planning systems in Norway and Sweden make attempts in this direction, but also that far more is needed to meet requirements. The planning process focuses very much on traditional investment projects and only to a limited extent on other relevant measures, such as regulatory measures, pricing and support to public transport. The planning process is a joint process where all transport agencies participate, but assessments across the sectors are not common at this stage. Cross-sectoral prioritisation, as discussed in Section 7.2 below, is, therefore, also most limited. There is, consequently, considerable room for improvement of the planning process in respect of more comprehensive and cross-sectoral evaluations.

### **7.1.4 Complexity**

The national strategic planning process has become very complex and it requires substantial planning resources. This appears most clearly in current Swedish planning, which represents a second round with the same approach. Planning fatigue, in at least some of the transport agencies, is becoming an issue. The



complexity that makes it difficult for planners to overview the process was also discussed after the previous planning round in Sweden (Vägverket).

Planning fatigue is to some extent due to that too many activities shall be carried out within a short time period. The limited time frame for the planning process seems to be a general problem. There are, however, also other reasons for complaint, among them planning guidelines that are too vague, conflicts in respect of the interpretation of objectives and planning methods that are adapted to the results wanted.

There appears to be an imbalance between the level of ambition and the complexity of the current national strategic planning processes in Scandinavia and the time available. Consequently, there is a need for better structuring of the planning approach to reduce the problem of complexity and also a need for more realistic planning and scheduling. It appears that the planning approach can be improved by re-organising the process. A clearer division into a first a phase of clarification of general policy principles through analyses of strategic issues and a second phase of developing alternative strategies may be a better approach.

#### **7.1.5 Institutional Characteristics**

Norwegian and Swedish experience show that the inherent institutional characteristics of the planning agencies are key factors in the process. The national road agencies in both countries played a more active role in the process than the other transport agencies and the railway track agencies came second. This was partly due to that the road agencies had previous experience of this type of strategic planning and partly due to their size, resources and planning capacity. The civil aviation agencies, on the other hand, kept a low profile. They are in both countries financed through user charges and have no financial interest in the planning process. The main antagonists from a financial point of view are the road and railway track administrations, which are main competitors for public funding. It may, therefore, be worthwhile to consider if the process can be organised differently with a clearer distinction between efforts that must be carried out jointly and matters that do not necessarily involve all parties.

There were extensive discussions between the agencies in Sweden concerning interpretation of the goals and objectives for the transport sector and the relationship between operational objectives and overall goals, which have not yet been expressed in operational terms. There was also disagreement on how to apply the principle of socio-economic efficiency in the development of the three strategies. This disagreement was reflected in the discussion about which measures to include in the various strategies. The disagreement concerning interpretation of goals and objectives continued throughout the work and might have affected the planning process and co-operation between the parties negatively. The railway participants, for instance, felt that their opinions and interests were disregarded in the process.

The experience with national strategic transport planning in Scandinavia clearly indicates that the institutional characteristics of the planning agencies play a prominent role in the planning process. It is therefore important to consider how

the planning process can be organised differently to reduce the conflicting interests to a minimum. Such re-organising of the process and the overall evaluation approach may, at this stage, be more important than development of new evaluation methods.

#### **7.1.6 Other Concerns**

In addition to the issues discussed above, it is worth mentioning that the use of ex post evaluation in Scandinavia represents a quality in itself. The planning process can only be said to be fully complete when ex post evaluations systematically are included as a last component. The Scandinavian ex post evaluation experience is focused on the planning process and the methods applied. Ex post evaluation is, however also required to establish whether the planned results are reached or, more specifically, to which extent the objectives are met and the expected output achieved. Such knowledge is in fact fundamental for an objective-oriented planning system. Experience shows that even the most sophisticated planning systems do not solve all problems. Ex post evaluation can, however, by identifying how they actually perform, contribute to the gradual improvement of such systems.

The relationship between planner and politician is a major concern for the planning approach applied in Scandinavia. The current planning system can only function effectively if politicians receive the information needed at the right point of time. Unfortunately, comparatively little is known about this issue at present. There is, consequently, a need for further investigation of what information politicians use in the decision-making process.

### **7.2 Prioritisation across Sectors**

The evaluation of the national strategic transport planning process in Norway showed that the national transport agencies to a great extent achieved a common understanding of the problems at hand and agreed on a common description of conditions in the sector. The recommended strategy was, however, a product of the sector plans rather than a product of a joint process. The evaluation study concluded that the actual co-operation primarily had been one of presenting general transport policy principles, rather than a mutual scrutinising of the agencies' measures.

The Norwegian agencies agreed during the planning process that they did not have the necessary quantitative methods and planning tools to assess the effectiveness of their measures across the transport sectors. They did not agree to use more qualitative methods for evaluating impacts of co-ordinated policies across the sectors and of transferring traffic from one mode to another.

The study of the Swedish national strategic planning process showed weaknesses in the planning process at the national level. The professional level of ambition was high. The planning process was, however, characterised by inadequate

knowledge and disagreement between planning agencies about the quality and relevance of the actual knowledge. Cross-sectoral prioritisation was very limited and socio-economic efficiency did only play a minor role in the process. The potential for comprehensive and cross-sectoral strategic planning did, therefore, not materialise fully.

The national analysis and the three strategic alternatives in Sweden were not limited to projects and measures that are controlled by the transport agencies. The analysis also included other measures such as CO<sub>2</sub>-levy and speed reductions on roads. Subsidies to public transport as a measure, which can reduce the need for investment in infrastructure projects, was not among the measures considered.

The evaluation studies revealed a serious weakness in respect of cross-sectoral prioritisation in the strategic planning processes in both Norway and Sweden. To which extent this was due to an insufficient knowledge basis or lack of tools, which normally would be the conclusion of planners, or to which extent the professional level of ambition for the process was realistic, is open for discussion. The planning approach was very ambitious in scope and based on successful and timely application of a range of methods and planning tools. The process could therefore easily be distorted if some elements were not fully up to the standard or if components of the process took more time than scheduled. Shortcomings in respect of genuine cross-sectoral prioritisation are obviously a serious problem for a process that aims at comprehensiveness and systematic evaluation of measures in all transport sectors against each other. Considering the circumstances and the tight planning schedules in both Norway and Sweden, it seems that the planning approach and the ambitious processes were more to blame than the various evaluation methods and planning tools applied.

### **7.3 Analysis of Specific Strategic Issues**

The analysis of 12 specific strategic issues was a new element in Swedish transport planning. There were deficiencies in the carrying out of the various analyses, but this was partly due to the very short time available for this component. The analyses were important for the development of alternative strategies and represented a new and most useful element of the planning system. Some analyses were highly critical for prioritisation among the various categories of measures in the final strategic plan, in particular between investments and other categories of measures.

The analyses were based on a system approach that included both investments and other measures and some were clearly cross-sectoral. Subsidising public transport, which was not considered a measure when designing the alternative strategies, was taken into account in one of the analyses dealing with urban transport.

In Norway, the national planning process included an analysis of the national transport corridors. This analysis did not progress very much in respect of quantitative analyses of the individual corridors. However, if the approach had been more quantitative and if time had allowed, the exercise might have provided a useful framework for the subsequent development of alternative strategies.

Generally, inclusion of analysis of strategic issues in the approach proved successful in Sweden. This analysis was also the most comprehensive and cross-sectoral element of the planning process. It appears, therefore, that the component should be developed further as an important part of the strategic planning process.

#### **7.4 The Evaluation Methods**

Compared to planning tools for strategic transport planning in other European countries, the Swedish standard is quite high. Nevertheless, serious problems with transport demand models were encountered during the process. The same applied to the planning tools that subsequently were used for assessing impacts of the strategies and that were adapted to and linked to the demand models. The problems may mainly have been due to overoptimistic programming and scheduling of the model development component. The resulting delays affected the subsequent socio-economic efficiency calculations negatively.

The ex post evaluations of planning methods in Sweden addressed, in particular, the methods for cost-benefit analysis. The general conclusion was that the methods as such appear to be sound and adequate for the purpose. Questions raised concerned primarily current practises. A more serious question, however, concerned the quality of input data, in particular traffic data. It may, therefore, at this stage be more important to improve traffic data and to introduce a reliable system for documentation of such data than to improve the methods for cost-benefit analysis. An earlier process evaluation study (Vägverket) also raised doubt about application of the methods and asked if they had been adapted to the results wanted.

There was a need for better methods for analysis of the specific strategic areas, which formed a new and important element of the Swedish strategic planning system. This applied not least to the analysis of maintenance needs, which revealed serious methodological shortcomings. It is, therefore, important to improve the methods for analysis of strategic issues.

The evaluation of the Norwegian strategic planning process showed that the agencies were not able to evaluate impacts across sectors in a comparable way. The coastal agency and the civil aviation agency were hardly able to assess the impact of their own measures at all. In addition, the agencies faced problems in handling intermodal transport in a satisfactory way. The agencies agreed that they did not have adequate quantitative methods to assess the effectiveness of their measures across the transport sectors.

There is obviously a need for further development of evaluation methods and, in particular, some of the supporting tools such as national and regional transport demand models. Current practises may to some extent be a bigger problem than the methods per se, and it appears highly important to ensure that input data are of sufficient quality and that they are documented properly. Development of the specific evaluation methods must be done in such way that they fit into the overall evaluation approach. There is a clear need for developing better methods for analysis of strategic issues.

## **7.5 Which Actions and Measures should be considered?**

Calculations of impacts of the three strategic options applied in Sweden revealed that differences among the alternative strategies were rather small at the national level. The same seemed to be the case in Norway. Generally, it appeared that ordinary investment projects led to small differences in overall impacts. Packages of specific physical measures, for instance road safety measures applied generally all over the country led to more significant differences. Application of "global measures" such as introduction of a national CO<sub>2</sub>-levy and lower general speed limits leads to considerable differences. It is important to note that some strong measures, such as a national CO<sub>2</sub>-levy is not controlled by the transport sector but falls under the Ministry of Finance.

The Norwegian process evaluation study showed that planners felt the plan should have included measures beyond the control of the agencies. The agencies did identify and describe such measures in the more general part of the plan. They were, however, restricted by the planning guidelines to base their recommended strategy on policy measures already approved by the ministries or Parliament. This might have made it easier for the agencies to focus on their own contributions to the achievement of transport policy objectives. Inclusion of other measures beyond the control of the planning agencies might have shifted attention away from measures controlled by them. Transport planning can, however, be rather frustrating, when conditions and measures that most significantly affect the achievement of transport policy objectives are to be treated as external factors in the process.

It was considered a problem in the Norwegian planning process that the national transport policy objectives were quite ambitious and broadly defined by the ministries. This created a gap between planning objectives and measures available to the agencies to meet the measures.

A main conclusion in respect of objectives is that policy objectives should be reasonable realistic and achievable at least in a longer time perspective compared to the range of measures actually available to the strategic transport planners. When the objectives are more ambitious, the planners should also be allowed to use a wider range of measures. That, however, may to some extent shift focus away from the measures controlled by the planning agencies.

## **7.6 The Role of the Regional Level in National Strategic Transport Planning**

The planning process at the regional level in Sweden had a different character than the process at the national level. It was more geographically specific and more problem-oriented. The regional level looked to some extent into transport corridors and major projects. It appeared a somewhat more comprehensive and cross-sectoral process than the process at the national level. The regional process was, however, less analytical and less focused on strategic considerations.

The regional planning process in Sweden appeared to function smoothly. The local planning authorities defined the objectives of the regional development

alternative in a way that reflected a common understanding of the regional transport challenges among the participants. The process was more harmonious at the regional level than at the national level and the various parties were agreeable to the objectives developed and the resulting regional plan. The relatively generous financial framework for investment projects and other measures in the two counties studied did, however, not necessitate the same strict prioritising as at the national level.

In Norway, a recent ex post evaluation study shows that regional and local authorities primarily were involved in the planning process at an early stage through their work on local challenge documents (Stenstadvold, M. and Lerstang, T.). Counties and local communities, however, also at a later stage commented on the national transport plan proposal, primarily focusing on the county-specific priorities. Representatives of the counties and communities found that the actual planning process improved transparency and local political involvement compared to previous processes, even if shortage of time made hearings and political processes at the local level difficult.

The above experience gives reasons to raise the question whether more of the planning process, or at least the preparatory phases, in future could be handled at the regional level. Concerns in respect of more responsibility to the regional level in the planning process were raised in the Norwegian study referred to above. A preliminary conclusion is that experience so far indicates a need for regional participation in national strategic transport planning and that such participation has functioned well in Sweden. The possibilities for regional participation in future should, therefore, be investigated further.

## **8 Main Conclusions**

The review of the Scandinavian experience of national strategic transport planning shows that the current planning concept in many respects is fairly advanced and well designed. A range of ex post evaluation studies have been carried out and have given insight into current processes and methodologies. One of the major findings is that the institutional characteristics of the planning agencies play a very important role in the planning process.

Generally the current planning systems and planning approach in Norway and Sweden are similar and well in line with the requirements of the conceptual framework as developed over the last decades in Scandinavia. Denmark has a somewhat different and more project oriented approach. The conclusions below therefore primarily refer to Norway and Sweden.

Below follows a presentation of the main conclusions of the paper in respect of the relevance of the planning concept, the methodological approach and the need for further development of evaluation methodologies.

### **8.1 The Relevance of the Planning Concept and the Methodological Approach**

#### **8.1.1 The Political Process Perspective**

It is difficult at this stage to assess the relevance of the current strategic planning process in respect of the subsequent political decision-making process in Parliament. It is, however, only when the technical planning process can be seen in the light of the political process, that we get full feedback about the appropriateness of the technical process.

A study about Parliament's discussion of the Norwegian Road- and Road Traffic Plan for the previous planning period casts some light on the matter. The study concluded that very few politicians did seriously consider and use the information on alternative strategies. It is, therefore, at this point in time not clear whether the strategic transport planning processes now applied really provide the most relevant decision information for the politicians. An ongoing study about the political process concerning the current National Transport Plan in Norway is, however, looking further into the matter.

#### **8.1.2 The Planning and Methodological Approach**

Generally the current approach is well in line with the requirements of the conceptual framework. There are, however, some matters of concern.

One concern is the objectives that guide the planning process. There are cases where there are discrepancies between the objectives and the measures available to the planning agencies. A key conclusion is that policy objectives should be realistic and achievable within a reasonable time perspective compared to the range of measures available to the strategic transport planners. If the objectives are more ambitious and broadly defined, planners should also be allowed to use a wider set of measures, but that may shift focus away from the measures controlled by themselves.

Another concern is the strategy concept applied in Norway and Sweden. The planning agencies are requested to develop alternative strategies that include different combinations of actions and measures. The basic idea behind the strategy concept is that politicians shall discuss strategies rather than projects and, finally, select a strategy, which then will provide the framework for the more detailed planning and implementation. Experience from ex post evaluation shows that there are good reasons to discuss whether the above approach to strategy-orientation is the best. It appears that the strategies developed by the planning agencies not necessarily are significantly different in respect of projects and measures included. Further, the little we know at this stage about the political process does not indicate that politicians find the strategies particularly useful in their decision-making process. The strategies may, however, be useful for others such as the Ministry of Transport.

The evaluation studies revealed serious problems, in respect of cross-sectoral prioritisation in both Norway and Sweden. It is, therefore, an open question to which extent these problems were due to insufficient knowledge or to lack of tools, which normally would be the conclusion of planners, or to which extent the professional level of ambition for such planning is realistic? It seems, however that the planning approach and the ambitious processes were more to blame than the various evaluation methods and planning tools applied.

There are reasons to believe that the planning approach can be improved by re-organising the process. A division into a first a phase of clarification of general policy principles through a set of analyses of strategic issues and a second phase of developing alternative strategies may be a better approach. Further, it appears that the regional level should play a bigger role in the national planning process. A two phased approach would facilitate involvement from the regional level at an appropriate time in the first phase of the process.

Experience from Norway and Sweden shows that the inherent institutional characteristics of the planning agencies are key factors in the process. The road agencies and the rail agencies played the most important roles, whereas the civil aviation agencies, which are financed through user charges, kept a low profile. It may, therefore, be worthwhile to consider if the process can be organised differently with a clearer distinction between efforts that must be carried out jointly and matters that do not necessarily involve all agencies.



## **8.2 Further Development of Evaluation Methodologies**

Ex post evaluations of planning methods in Sweden addressed the methods for cost-benefit analysis. The general conclusion was that the methods as such appear to be sound and sufficient for the purpose. Questions raised concerned primarily current practises. A more serious question, however, concerned the quality of input data, in particular traffic data. It may, therefore, at this stage be more important to improve traffic data and to introduce a reliable system for documentation of such data, than to improve the methods for cost-benefit analysis. A previous evaluation study raised some doubt about application of the methods and asked if they had been adapted to the results wanted.

The evaluation of the Norwegian strategic planning process showed that the agencies were not able to evaluate impacts across sectors in a comparable way. The coastal agency and the civil aviation agency were hardly able to assess the impact of their own measures at all. In addition, the agencies faced problems in handling intermodal transport in a satisfactory way. There is consequently a need for developing compatible methods for all sectors.

There were shortcomings in respect of better methods for analyses of the specific strategic areas, which formed a new and important element of the Swedish strategic analysis. This applied not least to the analysis of maintenance needs. It is therefore important to improve methods for analysis of strategic issues.

There is obviously a need for further development of the evaluation methods and in particular some of the supporting tools such as the national and regional transport demand models. Current practises may to some extent be a bigger problem than the methods per se and it appears that it is highly important to ensure that input data are of sufficient quality and documented properly. Development of the specific evaluation methods must be done in such way that they fit into the overall evaluation approach.

## 9 References

Kommunikationsdepartementet

*Transportpolitik för en hållbar utveckling (Transport Policy for a Sustainable Development)*. Prop. 1997/98:56. Kommunikationsdepartementet, Stockholm, 1997

Larsen, O. I. and Rekdal, J.

*Evaluering av den svenske innretningsplanleggingen. Strategiske analyser og beslutningsunderlaget for tiltak (Evaluation of Strategic Transport Planning in Sweden: The Strategic Analyses and the Decision Basis for Measures Applied)*. TØI Working Report 1154/2000. Institute of Transport Economics, Oslo, 2000

Lauridsen, H. et al.

*Strategisk vegplanlegging. Oppsummering av erfaringer med strategisk planlegging (Strategic Road Planning)*. TØI Report 316/1995. Institute of Transport Economics, Oslo, 1995

Lauridsen, H. and Ravlum, I. A. (2000 a)

*Evaluering av prosessen i den svenske innretningsplanleggingen (Evaluation of the Strategic Transport Planning Process in Sweden)*. TØI Report 469/2000. Institute of Transport Economics, Oslo, 2000

Lauridsen, H. and Ravlum, I. A. (2000 b)

*Strategisk transportplanlegging i Norge og Sverige - Evaluering av planprosessen (Strategic Transport Planning in Norway and Sweden - Ex post Evaluation of the Planning Process)*. Paper presented at the Transport Conference at Aalborg University 2000. Proceedings, Volume 2. The Danish Transport Council and the Transport Research Group at Aalborg University, Aalborg, 2000

Leleur, S.

*Road Infrastructure Planning. A Decision-oriented Approach*. Polyteknisk Forlag, Lyngby-Copenhagen, 2000

Lerstang, T.

*Which Strategic Planning? The Emerging Interest for Application of Strategic Environment Assessment in Transport Planning at Various Levels*. In the Proceedings from the 14<sup>th</sup> International Symposium on Theory and Practice in Transport Economics: Which Changes for Transport in the Next Century? Innsbruck 21-23 October 1997. ECMT, 1997

Norges offentlige utredninger (1989)

*En bedre organisert stat (A better organised State)*. NOU 1989:5.  
Forvaltningstjenestene Statens Trykkingkontor, Oslo, 1989

Norges offentlige utredninger (1993)

*Nytt overordnet styringssystem for Statens vegvesen (New Governance System for the National Public Roads Authority)*. NOU 1993:23. Statens  
Forvaltningstjeneste, Seksjon Statens Trykning, Oslo, 1993

Ravlum, I. A.

*Helhetlig, tverrsektorielt og åpent? - Transportetatenes samarbeid om Nasjonal transportplan 2002-2011 (Comprehensive, Cross-sectoral and Transparent? - The Joint Planning Process of the National Transport Agencies for the National Transport Plan 2002-2011)*. TØI Report 488/2000.  
Institute of Transport Economics, Oslo, 2000

Ravlum, I. A. and Stenstadvold M.

*Fra vegstubber til strategi og helhet? Stortingets behandling av norsk veg- og vegtrafikkplan 1998 - 2007 (From Stumps of Road to Strategy and Comprehensiveness. Parliament's Discussion of the Norwegian Road- and Road Traffic Plan 1998-2007)*. TØI Report 374/1997. Institute of Transport Economics, Oslo, 1997

Riksrevisionverket

*Vägverkets, Banverkets og länens förslag til infrastrukturinvesteringar åren 1998-2007 - En kvalitetsbedömning av beslutsunderlaget (The Road Authority's, the Railway Track Authority's and the Counties' Proposal on Infrastructure Investments 1998-2007 - A Quality Assessment of the Decision Basis)*. Report RRV 1997:60. Riksrevisionsverket, Stockholm, 1997

Samferdselsdepartementet

*Nasjonal transportplan 2002-2011 (National Transport Plan 2002-2011)*.  
St.meld. nr. 46 (1999-2000). Samferdselsdepartementet, Oslo, 2000

SAMPLAN

*Strategisk Analys - Sluttrapportering av regeringsoppdrag om inriktningen av infrastrukturplaneringen för perioden 2002-2011 (Strategic Analysis - Final Report on the Policy for Infrastructure Planning for the Period 2002-2011)*.  
SAMPLAN Report 1999:2. SAMPLAN, Stockholm, 1999

Sekretariatet for Nasjonal transportplan

*Forslag til Nasjonal transportplan 2002-2011 (Analyses and Recommendations on the National Transport Plan 2002-2011 from the four National Transport Agencies)*. Sekretariatet for Nasjonal transportplan 2002-2011,  
Vegdirektoratet, Oslo, 1999

SIKA (1996)

*Synspunkter på inriktningsplaneringen för väg- och järvägsinvesteringar (Review of the Socio-economic Evaluation of Road and Railway Investments in the Strategic Transport Plan 1998-2007).* SIKA Report 1996:2. SIKA, Stockholm, 1996

SIKA (1998)

*Lägesanalys - En första rapport om inriktningen av planeringen för transportinfrastrukturen 2001-2011. (Analysis of the Current Situation - First Report on the Policy for Planning of Transport Infrastructure 2001-2011.* SIKA Report 1998:8. SIKA, Stockholm, 1998

Statens vegvesen

*Håndbok 140: Konsekvensanalyser (Handbook 140: Impact Assessment of Road Projects).* Vegdirektoratet, Oslo, 1995

Stenstadvold M. and Lerstang T.

*Nasjonal transportplan 2002 - 2011. Evaluering av prosessen med fylkenes utfordringsdokument (National Transport Plan for Norway 2002-2011: Evaluation at the Planning Process at the Regional Level).* TØI Note 1138/1999. Institute of Transport Economics, Oslo, 1999

Trafikministeriet (1993a)

*Trafik 2005 - Problemstillinger, mål og strategier (Transport 2005 - Problems, Goals and Strategies).* Trafikministeriet, Copenhagen, 1993

Trafikministeriet (1993b)

*Trafik 2005 - Trafikpolitisk redegjørelse (Transport 2005 - Transport Policy).* Trafikministeriet, Copenhagen, 1993

Transportrådet (1993)

*4 baggrundsnotater til Trafik 2005 (4 Background Notes for Transport 2005).* Note No. 93-09. Transportrådet, Copenhagen, 1993

Transportrådet (1999)

*Beslutningsgrundlag for trafikinvesteringer (A Decision-making Basis for Transport Investment).* Report No. 99-01. Transportrådet, Copenhagen, 1999

Vägverket

*Utvärdering av planeringsprocessen vid framtagandet av Nationell Plan för vägtransportsystemet 1998-2007 (Evaluation of the Planning Process for the National Road Transport System Plan 1998-2007).* Publication 1998:79. Vägverket/Consultus, Borlänge/Stockholm, 1998